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TITLE: SOYBEAN PROTEIN COCOA GRANULE AND ITS PREPARATION

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ABSTRACT:

PROBLEM TO BE SOLVED: To obtain the subject granules easily dissolving and dispersing not only in warm water but also in cold water by spraying an aqueous solution containing water-soluble polysaccharides and sugar alcohols to powder containing soybean protein and cocoa as main components and pelletizing.

SOLUTION: The objective granules containing 1-6wt. of water-soluble polysaccharides and 0.5-2wt. of sugar alcohols and capable of dispersing and dissolving even in cold water is obtained by spraying an aqueous solution containing 2-10wt. of water-soluble polysaccharides such as pullulan or water-soluble hemicellulose and 0.5-2wt. of sugar alcohols such as trehalose and erythritol to the powder containing soybean protein and cocoa as main components.

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protein has, and fat combustion efficiency and is desirable. Usually, 15 - 25 % of the weight is [the balance of soybean protein and cocoa] appropriate for 15 - 50 % of the weight, and cocoa powder, and powdered soybean protein excels and is suitable also for flavor.

[0010] Moreover, the mixed-powder end of soybean protein and cocoa which the soybean protein solution and the cocoa solution were beforehand mixed depending on the manufacture method, and carried out spray drying etc. can be used, or a granulation agent can also be sprayed and granulation-ized in the case of this spray drying.

[0011] In addition, the soybean protein and cocoa granulation of this invention can contain a dietary fiber (water-soluble polysaccharide, such as an inulin, especially water-soluble dietary fiber, for example, water-soluble hemicellulose, etc. is desirable), a vitamin, a mineral, etc. In addition, although thickening agents, such as sugar-alcohol, such as oligosaccharide, such as a trehalose, and erythritol, and a pullulan, milk powder, a spice, a sweetener, a flavoring, and a fats-and-oils component can also be included, when aiming at a low calorie bevel use, it is desirable to stop the content of an oil content as much as possible.

[0012] The soybean protein and cocoa granulation of this invention bring about the effect in which a granulation being carried out and being granulation-ized including water-soluble polysaccharide and sugar-alcohol as a granulation agent carries out the distributed dissolution easily to warm water and cold water.

[0013] As water-soluble polysaccharide used as a granulation agent, a pullulan, a water-soluble hemicellulose, xanthan gum, gum arabic, Cyamopsis Gum, a carrageenan, locust bean gum, an arabinogalactan, GATTIGAMU, the hydrolyzate of gums, a modified starch, etc. are divided, and a pullulan and a water-soluble hemicellulose are suitable for them.

[0014] If 0 and 1 - 6 % of the weight are suitable and there is, the dispersibility to warm water and cold water of soybean protein and cocoa granulation will become bad, when there was too much water-soluble polysaccharide used as a granulation agent and warm water and cold water are made to distribute soybean protein and cocoa granulation, viscosity becomes high and it serves as a feeling of a meal heavy as a drink. [too little]

[0015] As sugar-alcohol used as a granulation agent, a sorbitol, erythritol, a mannitol, xylitol, a maltitol, etc. are divided and erythritol is suitable for them.

[0016] Since the taste -- the drink which warm water and cold water were made to distribute will become sweet about soybean protein and cocoa granulation depending on the kind of sugar-alcohol if many [if 0 and 2 - 2 % of the weight are usually suitable and it is too few, the dispersibility to warm water and cold water of soybean protein and cocoa granulation will become bad, and / too] -- comes out strongly, the sugar-alcohol used as a granulation agent is not desirable.

[0017] Next, the manufacturing method of soybean protein and cocoa granulation is explained. The solution containing water-soluble polysaccharide and sugar-alcohol can be sprayed on the fine particles which make soybean protein and cocoa a principal component, and the soybean protein and cocoa granulation of this invention can corn and manufacture it to them. In order to make the granulation portion of soybean protein content cocoa contain 0 and 1 - 6% of the weight (preferably 1 - 5 % of the weight) of water-soluble polysaccharide and 0, and 2 - 2% of the weight of sugar-alcohol, the concentration of the solution containing the water-soluble polysaccharide and sugar-alcohol to spray usually has 2 - 10 % of the weight of water-soluble polysaccharide, sugar-alcohol 0, and 5 - 2 desirable % of the weight. It is because it must spray so much for a long time, dryness will also take time and productivity will fall, if such concentration is too low. Moreover, if such concentration is too high, it will become difficult to spray on the front face of soybean protein content cocoa uniformly, and to corn.

[0018] in addition, the target effect is hard to be acquired even if it uses it by the water-soluble polysaccharide and sugar-alcohol [of each] independent

[0019] A granulation can use a well-known fluid bed granulation. Suitably, it is appropriate to corn by the fluid bed granulation inside of a plane, the fine particles which make soybean protein and cocoa a principal component using a fluid bed granulating machine are maintained at a flow state, the condensation granulation of the binding material (the aforementioned water-soluble polysaccharide and sugar-alcohol) is sprayed and carried out to this, and it is appropriate to perform some processes, such as mixture, a granulation, and dryness, within a simple machine still more suitably. The number of processes can be decreased by doing in this way, and since the granulation object which is easy to melt in porous one is obtained, rationalization of work and improvement in quality can be aimed at.

[0020] Specifically, raw materials, such as powder soybean protein and cocoa powder, are paid to a raw material container, it changes into a fluidization state first, and fine particles are mixed. Next, spraying of the mixed-water solution of the water-soluble polysaccharide used as a granulation agent and sugar-alcohol is performed until it becomes the particle size of choice, and a granulation article is obtained through dryness and a cooling process.

[0021] Thus, the obtained soybean protein and cocoa granulation carry out dissolution distribution easily not only at warm water but at cold water.

[0022] moreover, the ** cholesterol effect of soybean protein and the cholesterol fall effect of cocoa act on a multiplication target, bring about the fall of cholesterol, and can also expect an effect to the lean figure, such as bringing about reduction, and cosmetics of body fat. Moreover, by considering as a low fat, nutrients, such as protein, can take in easily as a drink, and can expect the effect of recovery from fatigue of the muscles after a sport etc. only as a diet.

[0023] Next, an example explains this invention concretely. In addition, among an example, especially % is a weight standard, unless it refuses.

[0024]

[Example]

Pullulan 8%, 500ml of erythritol 0.8% mixed-water solutions was sprayed on the mixed-powder object with which the fluid bed granulating machine was made to put in and mix 400g [of example 1 powder soybean protein], and cocoa powder 200g, 200g of sugar, and 200g of skimmilk powder, the granulation was carried out to it, and soybean protein and cocoa granulation were obtained on it.

The mixed-powder object was put into the fluid bed granulating machine like example 2 example 1, soybean water-soluble hemicellulose 4%, erythritol 0 and 500ml of 8% of mixed-water solutions were sprayed, the granulation was performed, and soybean protein and cocoa granulation were obtained.

With it being the same as that of example of comparison 1 example 1, similarly, 250ml of lecithin 7% solution was sprayed on the mixed-powder object, the granulation was carried out to it, and same soybean protein and cocoa granulation were obtained on it.

Like example of comparison 2 example 1, 500ml of pullulan 8% solution was sprayed on the mixed-powder object, the granulation was carried out to it, and same soybean protein and cocoa granulation were obtained on it.

Like example of comparison 3 example 1, erythritol 0 and 500ml of 8% of solution were sprayed on the mixed-powder object, the granulation was carried out to it, and same soybean protein and cocoa granulation were obtained on it.

Like example of comparison 4 example 1, 500ml of 4% solution of soybean water-soluble polysaccharide was sprayed on the mixed-powder object, the granulation was carried out to it, and same soybean protein and cocoa granulation were obtained on it.

The result which took soybean protein and 15g of cocoa granulation obtained in example of experiment 1 examples 1 and 2 and the examples 1-4 of comparison, scattered O and the thing which carries out dissolution distribution although time is taken for a while ** and a dissolved part, twisted what 150ml warm water (85 degrees C) and cold water (about 17 degrees C of tap water) are made to carry out the distributed dissolution, and carries out dissolution distribution easily, and evaluated the thing as x is shown to Table 1.

[0025]

[Table 1]

	Dispersibility to warm water	Dispersibility to cold water
Example 1	O	O
Example 2	O	O
Example 3	O	O
Example 4	O	O
Example 1 of comparison	x	O
Example 2 of comparison	O	x
Example 3 of comparison	x	x
Example 4 of comparison	O	x

[0026]

[Effect of the Invention] By this invention, the soybean protein and cocoa granulation which carries out dissolution distribution easily come to be obtained by not only warm water but cold water.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates not only to hot and cold water but to cold water at the soybean protein and cocoa granulation which carries out dissolution distribution easily, and its manufacturing method.

[0002]

[Description of the Prior Art] If warm water is poured out, since cocoa powder will tend to become insoluble, it is usually made with the shape of a paste with little hot and cold water, pours out the remaining hot water, and is made to distribute it uniformly. Moreover, soybean protein also tended to become insoluble when warm water was poured out similarly, and making it distribute uniformly suited its difficult inclination. It was hard to scatter the mixture of these cocoa powder and soybean protein powder to boiling water a dissolved part similarly, and it was simultaneously difficult also for cold water to carry out distributed solubilization easily.

[0003]

[Problem(s) to be Solved by the Invention] this invention aims at the mixed-powder end of the soybean protein which carries out dissolution distribution easily, and cocoa, and its manufacturing method not only in warm water but in cold water.

[0004]

[Means for Solving the Problem] That the aforementioned technical problem should be solved, wholeheartedly, as a result of research, this invention persons examined various granulation methods, by corning and granulation-izing the mixed-powder end of soybean protein and cocoa by the specific granulation agent, acquire the knowledge which can solve the aforementioned technical problem, and came to complete this invention.

[0005] That is, this inventions are ***** and cocoa granulation which makes a granulation agent water-soluble polysaccharide and sugar-alcohol. Moreover, it is the manufacturing method of the soybean protein and cocoa granulation characterized by this invention spraying and corning the solution containing water-soluble polysaccharide and sugar-alcohol to the fine particles which make soybean protein and cocoa a principal component, and the solution containing water-soluble polysaccharide and sugar-alcohol has 2 - 10 % of the weight of water-soluble polysaccharide, sugar-alcohol 0, and 5 - 2 desirable % of the weight.

[0006]

[Embodiments of the Invention] First, soybean protein and cocoa granulation are explained.

[0007] The soybean protein used for this invention can use well-known powdered soybean protein. For example, water-soluble things, such as soybean milk powder, powdered separation soybean protein, and these hydrolyzates, are suitable.

[0008] The cocoa used for this invention can use well-known powdered cocoa (the cocoa butter content which ground the cocoa cake is about 8% of the weight or more of a thing). Usually, although especially the cocoa powder used for this invention practical although the low fat type thing of about 10 to 12 % of the weight of cocoa butter content and the high fat type thing of about 20 to 24 % of the weight of cocoa butter content are generally known does not limit an oil content, it makes low the calorie of the soybean protein and cocoa granulation with which the way of the former low fat type is obtained, and is desirable as an object for diets.

[0009] The soybean protein and cocoa granulation of this invention make these soybean protein and cocoa a principal component. Usually, when aiming at the ** cholesterol effect of soybean protein and cocoa, the total quantity of more than soybean protein and the half in cocoa granulation is desirable. Moreover, compared with cocoa, the way with many amounts of soybean protein excels in the lean figure effect which gathers the ** cholesterol effect which soybean

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(54)【発明の名称】 大豆蛋白・ココア顆粒及びその製造法

(5)【要約】

【課題】 温水のみならず冷水にも容易に溶解分散する大豆蛋白含有ココア及びその製造法を目的とした。

【解決手段】 水溶性多糖類及び糖アルコールを造粒剤とする大豆蛋白含有ココア顆粒。水溶性多糖類及び糖アルコールを含有する水溶液を大豆蛋白及びココアを主成分とする粉体に噴霧し造粒することを特徴とする大豆蛋白・ココア顆粒の製造法。

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【特許請求の範囲】

【請求項1】水溶性多糖類及び糖アルコールを造粒剤とする大豆蛋白・ココア顆粒

【請求項2】造粒剤が0、1～10重量%の水溶性多糖類及び0、1～10重量%の糖アルコールを含有する請求項1の大豆蛋白・ココア顆粒

【請求項3】水溶性多糖類及び糖アルコールを含有する水溶液を大豆蛋白及びココアを主成分とする粉体に噴霧し造粒することを特徴とする大豆蛋白・ココア顆粒の製造法

【請求項4】水溶性多糖類及び糖アルコールを含有する水溶液が水溶性多糖類2～10重量%及び糖アルコール0、5～2重量%を含む請求項3の製造法

【発明の詳細な説明】

【00001】

【発明の属する技術分野】本発明は、湯水のみならず冷水にも容易に溶解分散する大豆蛋白・ココア顆粒及びその製造法に関する

【00002】

【従来の技術】ココアパウダーは温水を注ぐとマダコになり易い為、通常少量の湯水でペースト状となり残りの湯を注いで、均一に分散させる。また、大豆蛋白も同様に温水を注ぐとマダコになり易く、均一に分散させることが困難な傾向にあった。これらココアパウダー及び大豆蛋白粉末の混合物も同様に熱湯に溶解分散し難く、同時に冷水にも容易に分散可溶化することは困難であった

【00003】

【発明が解決しようとする課題】本発明は、温水のみならず冷水にも容易に溶解分散する大豆蛋白とココアの混合粉末及びその製造法を目的とする

【00004】

【課題を解決するための手段】本発明者らは、前記課題を解決すべく鋭意研究の結果、種々の造粒法を検討し、大豆蛋白とココアの混合粉末を特定の造粒剤で造粒し顆粒化することにより前記課題を解決できる知見を得て本発明を完成するに至った

【00005】即ち、本発明は、水溶性多糖類及び糖アルコールを造粒剤とする大豆蛋白含・ココア顆粒である

又、本発明は、水溶性多糖類及び糖アルコールを含有する水溶液を大豆蛋白及びココアを主成分とする粉体に噴霧し造粒することを特徴とする大豆蛋白・ココア顆粒の製造法であり、水溶性多糖類及び糖アルコールを含有する水溶液は水溶性多糖類2～10重量%、糖アルコール0、5～2重量%が好ましい。

【00006】

【発明の実施の形態】先ず、大豆蛋白・ココア顆粒について説明する

【00007】本発明に用いる大豆蛋白は公知の粉末状大豆蛋白を用いることが出来る。例えば、豆乳粉末、粉末

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状分解大豆蛋白、これらの加水分解物等水溶性のものも好適である

【00008】本発明に用いるココアは公知の粗粒ココア、ココアケーキを造粒したココアパウダー含有量が約8重量%以上のものを、用いることが出来る。通常、実用的には、ココアパウダー含有率約10～15重量%の低脂肪タイプのもので、ココアパウダー含有率約10～15重量%の高脂肪タイプのもので、一般的に知られているが、本発明に用いるココアパウダーは特に油分を限定しないが、前者の低脂肪タイプのほうが得られる大豆蛋白・ココア顆粒のカロリーを低くシダイエット用としては好ましい。

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【00009】本発明の大豆蛋白・ココア顆粒はこれら大豆蛋白及びココアを主成分とする。通常、大豆蛋白及びココアの降コレステロール効果を目的とする場合、その合計量が大豆蛋白・ココア顆粒中半分以上が好ましい。又、ココアに比べ大豆蛋白の量が多いほうが大豆蛋白の有する降コレステロール効果や脂肪燃焼効率を上げる複合効果等に優れ好ましい。通常、粉末状大豆蛋白が15～30重量%及びココアパウダーが15～30重量%が大豆蛋白とココアのバランスが適当で風味も良く好適である

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【00010】又、製造方法によってもは粉末大豆蛋白溶液とココア溶液を混合して噴霧乾燥等した大豆蛋白とココアの混合粉末を用いたり、この噴霧乾燥の際に造粒剤を噴霧して顆粒化することも出来る

【00011】その他、本発明の大豆蛋白・ココア顆粒は食物繊維（特に水溶性の食物繊維例えば水溶性ヘミセルロース、イヌリン等の水溶性多糖類等が好ましい）、ビタミン、ミネラル等を含むことが出来る。その他、トレハロース等の少糖類、エリスリトール等の糖アルコール、ソルラン等の糊料、粉乳、香辛料、甘味料、着色料、油脂成分を含むことも出来るが、低カロリー飲料利用を目的とする場合は極力油分の含有量を抑えることが好ましい。

【00012】本発明の大豆蛋白・ココア顆粒は造粒剤として水溶性多糖類及び糖アルコールを含んで造粒され顆粒化されていることが温水及び冷水に容易に分散溶解する効果をもたらすものである

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【00013】造粒剤として用いる水溶性多糖類としては、グルラン、水溶性ヘミセルロース、キサンタンガム、アラビガム、グアガム、カラギーナン、ローカストビーンガム、アラビノガラクトン、カンティガム、ガム類の加水分解物、化工澱粉等、とりわけ、グルラン、水溶性ヘミセルロースが適当である

【00014】造粒剤として用いる水溶性多糖類は0、1～10重量%が適当であり、少な過ぎると大豆蛋白・ココア顆粒の温水や冷水への分散性が悪くなり、多過ぎると大豆蛋白・ココア顆粒を温水や冷水に分散させたときの粘度が高くなり、飲料として重い口感となる

【0015】造粒剤として用いる糖アルコールとしては、ソルビトール、エリスリトール、マンニトール、キシリトール、マルチトール等、とりわけ、エリスリトールが適当である。

【0016】造粒剤として用いる糖アルコールは通常0.2～2重量%が適当であり、少な過ぎると大豆蛋白・ココア顆粒の温水や冷水への分散性が悪くなり、糖アルコールの種類によっては、多過ぎると大豆蛋白・ココア顆粒を温水や冷水に分散させた飲料が甘くなる等その味が強く出るので好ましくない。

【0017】次に、大豆蛋白・ココア顆粒の製造法について説明する。本発明の大豆蛋白・ココア顆粒は、水溶性多糖類及び糖アルコールを含有する水溶液を大豆蛋白及びココアを主成分とする粉体に噴霧し造粒して製造することが出来る。大豆蛋白含有ココアの造粒部分に0.1～6重量%（好ましくは1～5重量%）の水溶性多糖類及び0.2～2重量%の糖アルコールを含有させるには、噴霧する水溶性多糖類及び糖アルコールを含有する水溶液の濃度は、通常、水溶性多糖類2～10重量%、糖アルコール0.5～2重量%が好ましい。これらの濃度が低すぎると多量に長時間噴霧しなければならず、乾燥にも時間がかり生産性が低下するからである。又、これらの濃度が高すぎると大豆蛋白含有ココアの表面に均一に噴霧して造粒することが困難になる。

【0018】尚、水溶性多糖類、糖アルコール各々単独で使用しても、目的の効果は得られ難い。

【0019】造粒は公知の流動層造粒を利用することが出来る。好適には、流動層造粒機内で造粒することが適当であり、流動層造粒機を用い、大豆蛋白及びココアを主成分とする粉体を流動状態に保持しこれに結合材（前記水溶性多糖類及び糖アルコール）を噴霧して凝集造粒させ、更に好適には、同一機械内で、混合、造粒、乾燥などいくつかの工程を行うことが適当である。このようにすることにより工程数を減少でき、ボラースで溶けやすい造粒物が得られるため、作業の合理化、品質の向上をはかることが出来る。

【0020】具体的には、例えば、始めに、粉末大豆蛋白、ココアパウダーなどの原料を原料容器にしまい、流動化状態にして粉体の混合を行う。次に、造粒剤となる水溶性多糖類と糖アルコールの混合水溶液の噴霧を希望粒径となるまで行い、乾燥、冷却工程を経て造粒品を得る。

【0021】この様にして得られた大豆蛋白・ココア顆粒は温水のみならず冷水にも容易に溶解分散するものである。

【0022】又、大豆蛋白の降コレステロール効果とココアのコレステロール低下効果が相乗的に作用すること、

※ステロールの低下をもたらす、体脂肪の減少をもたらす等瘦身や美容にも効果が期待出来るものである。又、低脂肪とすることにより蛋白等の栄養素が飲料として容易に摂取でき、ダイエットとしてのみならず、スポーツ後等の筋肉の疲労回復の効果等も期待出来るものである。

【0023】次に実施例により本発明を具体的に説明する。なお、実施例中、%は特に断らない限り重量%である。

【0024】

10 【実施例】

実施例1

粉末大豆蛋白100g、ココアパウダー20g、砂糖100g、脱脂粉乳100gを流動層造粒機に入れ混合させた混合粉体に、フルラン8%、エリスリトール0.8%の混合水溶液500mlを噴霧し造粒を行い、大豆蛋白・ココア顆粒を得た。

実施例2

実施例1と同様にして混合粉体を流動層造粒機に入れ、大豆水溶性ヘミセルロース4%、エリスリトール0.8%の混合水溶液500mlを噴霧し造粒を行い、大豆蛋白・ココア顆粒を得た。

比較例1

実施例1と同様と同様にして混合粉体に、レシチン7%水溶液を250ml噴霧し造粒を行い、同様の大豆蛋白・ココア顆粒を得た。

比較例2

実施例1と同様にして混合粉体に、フルラン8%水溶液を500ml噴霧し造粒を行い、同様の大豆蛋白・ココア顆粒を得た。

40 【比較例3】

実施例1と同様にして混合粉体に、エリスリトール0.8%の水溶液を500ml噴霧し造粒を行い、同様の大豆蛋白・ココア顆粒を得た。

比較例4

実施例1と同様にして混合粉体に、大豆水溶性多糖類1%水溶液を500ml噴霧し造粒を行い、同様の大豆蛋白・ココア顆粒を得た。

実験例1

実施例1、2と比較例1～4で得られた大豆蛋白・ココア顆粒を15gとり、150mlの温水（85℃）及び冷水（水道水約17℃）に分散溶解させ、容易に溶解分散するものを、少し時間がかりか溶解分散するものを、一層溶解分散しないものを、それぞれ評価し結果を表1に示す。

【0025】

【表1】

温水への分散性 冷水への分散性

	(4)	時間平均値 (sec)
5		6
実施例1	○	1.5
実施例2	○	1.5
比較例1	○	1.5
比較例2	○	1.5
比較例3	○	1.5
比較例4	○	1.5

【0026】 *容易に溶解分散する大豆蛋白・ココア顆粒が得られるよ
 【発明の効果】本発明により、温水のみならず冷水にも* 用になったものである。